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Rhodora

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Photo W. R. Fisher

SAGITTARIA EDWARDSIANA: fruiting plant, × 2/5; FIG. 1, achenes, × 7
S. TERES: FIG. 2, achenes, × 7.
S. GRAMINEA: FIG. 3, achenes, × 7.

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SAGITTARIA EDWARDSIANA, A NEW SPECIES FROM THE NEW JERSEY PINE BARRENS

R. T. Clausen

(Plate 454)[1]

On June 30, 1935, Mr. J. L. Edwards, W. L. Highton, and the writer visited the New Jersey pine barrens in the vicinity of Speedwell, in quest of the rare *Pogonia divaricata*. After exploring this region, we botanized in the bogs along a small creek just above its junction with the Wading River, about two miles north of Washington, Burlington County. Here we found a great abundance of *Narthecium americanum*, also the southern *Rynchospora oligantha*, which we had found earlier in the day in a bog just south of Chatsworth. While the writer was collecting in the nearby bog, Mr. Edwards discovered and called his attention to a peculiar looking, decidedly succulent Sagittaria. Realizing that this was something that was new to us, we collected several of the plants. Unfortunately it was too early in the season for fruiting material, but most of the specimens were in flower, with the inflorescences raised just out of the water. The great, fleshy phyllodia mostly exceeded the scapes and tended to float on the surface. The plants were growing on a muddy bottom, in 1½ to 2 feet of water, in close association with *Scirpus subterminalis* and other submerged aquatic species.

Specimens of the flowering material of this Sagittaria obtained in 1935 have been shown to a number of critical students of the north-

[1] The publication of the Plate has been made possible through the kindness of Dr. L. H. Bailey.

eastern flora, but none have been able to satisfactorily determine it. Further, the writer has been quite unsuccessful in his attempts to match the plants with *S. teres* or the many forms of *S. graminea, subulata,* and other species with which it might be identified.

Without fruits, the Washington specimens could not be placed in any one of the known species groups in the genus. Consequently, attempts were made to secure such material during this season, 1936. On Aug. 28, more flowering plants were found in the Oswego branch of the Wading River near Martha, but still no fruits. On Sept. 15, the writer revisited the Washington station and collected a good fruiting specimen with mature achenes. Now, with all the characters known, we find that our plant is most closely related to *S. graminea* and *S. teres,* but different from both in several details.

The fruiting pedicels are erect, not recurved, thus eliminating the slight possibility of affinity with *subulata.* The phyllodia are decidedly elongate, terete and succulent, exceeding the scape, very different from the condition in either *teres* or *graminea.* True leaves with blades are apparently never developed. The peduncle is quite thick and fleshy, contrasting sharply with the rather slender scapes of *graminea* and *teres,* and bears regularly three or four whorls of flowers, three flowers in a verticel, with the lowest group pistillate. The achenes are most distinctive, differing from those of *graminea* in their turgidity, in their very dark brown, almost black, color, in having the straw-colored wings standing up to form definite ridges, and in having the minute beaks either erect or oblique, rarely incurved. From the achenes of *teres* these differ in having the wings both straw-colored and quite entire, not at all crenate or broken, as is regularly the case in that species. The staminate flowers bear twelve stamens, with the filaments slightly shorter and more pubescent than in *teres.*

In naming this species, I dedicate it to Mr. J. L. Edwards of Montclair, N. J., a most able and critical field botanist.

Sagittaria **Edwardsiana,** sp. nov.—Planta aquatica, monoecia, submersa radicibus fibrosis; phyllodia longa, linearia, teretia, succulentia, acuminata, plerumque superantia scapum 12–51 cm. longa 4 mm. crassa, aliquid nodosa; scapus aliquatenus crassus carnosusque, 22–53 cm. longus, 1–2.5 mm. crassus, fere tres vel quatuor verticillos ferens, infimos fertiles, pedicellis gracilibus bracteis ovatis fuscis subtentis, 3 mm. longis. Flores steriles in pedicellis 0.8–2 cm. longi; sepala tria, viridia, obtusa, 4 mm. longa; petala tria, alba, 5–6 mm. longa; stamina 12, filamentis valde dilatatis, 1 mm. longis, basi 0.8 mm. latis, dense

pubescentibus, antheris luteis, 1 mm. longis 0.8 mm. in diam. Pedicelli fertiles fructiferi erecti, 1.5 cm. longi; achenia fusca, 1.5–2 mm. longa, rostris minutis gracilibus vel erectis vel obliquis, marginibus lateribusque aliquot cristas stramineas, non crenatas, vel alas ferentibus.

SAGITTARIA **EDWARDSIANA**, n. sp. Monoecious, submerged aquatic herb with fibrous roots; phyllodia long, linear, terete, succulent, acuminate, usually exceeding the scape, 12–51 cm. long by 4 mm. thick, somewhat nodose; the scape relatively thick and fleshy, 22–53 cm. long and 1–2.5 mm. thick, typically bearing three to four whorls of flowers, the lowest pistillate, the slender pedicels subtended by dark ovate bracts, 3 mm. long. Staminate flowers on pedicels .8–2 cm. long; sepals three, green, blunt, 4 mm. long; petals three, white, 5–6 mm. long; stamens 12, with the filaments much dilated, 1 mm. long by .8 mm. wide at base, densely pubescent; the anthers yellowish, 1 mm. long and .8 mm. in diam. Pistillate pedicels erect in fruit, 1.5 cm. long, the achenes dark brown, 1.5–2 mm. long, with minute slender beaks either erect or oblique, the margins and sides with several stramineous entire crests or wings.—TYPE in Bailey Hortorium; COTYPES in Gray Herb., Cornell University Herb., and Clausen Herb. On muddy bottom in 1.5–2 ft. of water in branch of Wading River two miles north of Washington, Burlington Co., NEW JERSEY, June 30, 1935, *J. L. Edwards, W. L. Highton, and R. T. Clausen* 1741.

Besides the type collection there may be cited as topotypes: *W. C. Wilson and R. T. Clausen* 2358, in branch of Wading River north of Washington, Sept. 15, 1936; also *J. L. Edwards, J. Kezer, and R. T. C.* 2317, muddy bottom of Oswego River, Martha, Burlington Co., New Jersey, Aug. 28, 1936.

BAILEY HORTORIUM,
Ithaca, New York.

EXTENSION OF RANGE OF CALAMAGROSTIS EPIGEJOS.—At the time Prof. A. S. Hitchcock published his "Manual of the Grasses of the United States" February, 1935, this grass was known only from Harwich and Gloucester, Massachusetts, and from Montgomery County, Pennsylvania, northwest of Philadelphia.[1]

Early in September, 1936, a thriving colony of this grass was found in Juniper Swamp near Middle Village and south of Elmhurst, L. I.,

[1] Mr. Beals' material is like that at the stations in Massachusetts and Pennsylvania, which was discussed in detail in RHODORA, XXXV. 64, 65 (1933), whence Hitchcock derived his information. It belongs to var. GEORGICA (C. Koch) Ledeb., a local variety of southern Russia, rather than to the coarse, typical *Calamagrostis epigejos*, Hitchcock in his *Manual* not admitting most varieties.—M. L. F.

all of which places are within the City of New York, N. Y. Juniper swamp was drained and the low trees and bushes were cut off about twenty years ago. The area is crossed north to south by the New York Connecting Railroad, a double track line in a cut through morainal gravel. The banks of this cut are twenty-five to thirty feet high. The *Calamagrostis* colony is located west of the railroad and only a few feet from the bank of the railroad cut. It is irregular in shape and extends fifty feet north and south and an equal distance east and west. The grass is growing partly on sedge peat of the bed of the swamp and extends upwards over a sharply pitched gravel bank to the top, a height of fifteen feet above the swamp level. The grass forms a dense turf to the exclusion of all other plants. The culms reach a height of forty to forty-eight inches and there were thousands of fruiting panicles.

The colony seems to be spreading by underground shoots only. No smaller areas of this grass were found within a radius of a quarter of a mile of the large colony. This fact may indicate that this grass does not produce many seeds that will germinate. Plants growing on the sedge peat showed no greater vigor than those growing on the gravel slope.

Mrs. Agnes Chase verified my determination of this species and says that this is the first station of it reported from the State of New York.

Unfortunately this station will soon be destroyed as New York City is filling in the swamp to make a public park of the area. Already the filling operation has reached a point only two hundred feet from this colony. Before the first of the year this plat of grass will be covered to a depth of ten feet by cartloads of old plaster, broken brick, ashes and other refuse.

To avoid the extinction of this colony of grass I have dug sixty sizable sods and planted them along the sloping sides of the nearby railroad cut where they will have a possible chance of growing and spreading in area undisturbed by the development of municipal park plans.—A. T. Beals, 2929 Broadway, New York City.

CRITICAL BRYOPHYTES FROM THE KEWEENAW PENINSULA, MICHIGAN

WILLIAM CAMPBELL STEERE

(*Continued from page 14*)

For help kindly given in identification, the writer is grateful to E. B. BARTRAM, A. W. EVANS, M. FULFORD, A. J. GROUT, and A. J. SHARP.

Species of bryophytes which are new to the flora of Michigan are marked in the following list with an asterisk.

HEPATICAE

RICCARDIACEAE

METZGERIA FURCATA (L.) Dumort. This species was collected in July, 1933, on large basaltic boulders near Copper Harbor.[1] Since then, it has been discovered to be locally common at one locality in the Huron Mountains.[2]

Careful search during the summer of 1935 brought to light several new stations in Keweenaw County, although all the colonies occupied the same type of habitat, namely, the shaded, perpendicular sides of trap-rock ledges and large isolated fragments of the same rock.

PELLIACEAE

PELLIA NEESIANA (Gottsche) Limpr. On a rotten log in a small stream along the road to Jacobsville, Houghton County, September, 1935.

PELLIA FABRONIANA Raddi. On wet trap-rock and conglomerate ledges, Horseshoe Harbor, Keweenaw County, September, 1935.

LOPHOZIACEAE

*JUNGERMANNIA SCHIFFNERI (Loitlesb.) Evans. On wet trap-rock ledge, shore of Copper Harbor, Keweenaw County, September, 1935.

This species has a noteworthy disjunct distribution (FIG. 4). It has been reported from Hector and Stephen, British Columbia, very close to the Alberta boundary line,[3] and also from across the boundary line, in Alberta.[4] The only other area known in North America is in

[1] Steere, W. C., *Unreported or otherwise interesting bryophytes from Michigan*, Bryologist **37**: 57–62, 1934.

[2] Nichols, G. E., *loc. cit.*, 1935.

[3] Evans, A. W., *Notes on North American Hepaticae, VII.*, Bryologist **20**: 17–28, 1917.

[4] Brinkman, A. H., *List of hepatics of Pacific coast and adjoining territory*, Rept. Prov. Museum Nat. Hist. B. C., 1933: 24–33, 1934.

the Lake Superior region: Duluth, Minnesota;[1] Douglas, Bayfield, and Iron counties, Wisconsin,[2, 3] all of which adjoin Lake Superior.

*Jungermannia sphaerocarpa Hook. On rocks which are kept moist by seepage water and spray, but not washed over by waves, Copper Harbor, Keweenaw County, September, 1935.

This species is known from the Pacific Coast (California, Washington, British Columbia, Alaska); from the Rocky Mountain area (Colorado, Wyoming, Alberta), and from the Lake Superior shores of Minnesota, Wisconsin and Michigan. It has also been reported from King Oscar's Land and from Ellesmereland.[4]

Leiocolea Gillmani (Aust.) Evans, Bryologist **38**: 83. 1935. [*Lophozia Kaurini* (Limpr.) Steph.]. This is one of the most characteristic species to be found in sheltered places on the rocky shores of Keweenaw Peninsula. It grows in large mats just above the water level on the trap-rock and conglomerate ledges which form the shores of Agate, Copper and Horseshoe Harbors. Perianths are produced in abundance in these places.

This is a distinctly boreal species. The first North American report was from Alaska (in 1903). The range has been extended since throughout the northern Rocky Mountains, to the Lake Superior shores of Minnesota, Wisconsin and Michigan, and to a very few eastern stations (in Quebec and Vermont). The southernmost known locality in the United States is West Jefferson, Ohio.

Leiocolea heterocolpa (Thed.) Buch. This species is not uncommon in crevices of the low trap-rock and conglomerate cliffs along the lake shore, yet always above the reach of storm waves, and occasionally on rotten wood in the forest, Keweenaw County, September, 1935.

The range of this species, although wide, is typically arctic-alpine.

Lophozia attenuata (Mart.) Dumort. On moist trap-rock ledges along the shore of Copper Harbor and abundant on rotten logs in the forest, Fort Wilkins, September, 1935.

Another species of the Lake Superior region which is otherwise found in the United States only in the mountains of New England and in the far western states.

Lophozia Hatcheri (Evans) Steph. One of the most common

[1] Conklin, G. H., *Report of the Curator of the Hepatic Herbarium of the Sullivant Moss Society for 1924*, Bryologist **28**: 13–14, 1925.

[2] Evans, A. W., *Notei on North American Hepaticae, VII.*, Bryologist **20**: 17–28, 1917.

[3] Conklin, G. H., *The Hepaticae of Wisconsin*, Trans. Wis. Acad. **24**: 197–247, 1929.

[4] Bryhn, N., *Bryophyta in itinere polari Norvagorum secundo collecta*, Rept. 2d. Norweg. Arct. Exped. "Fram." 2 (11): 1–260, 1907.

species on moist trap-rock and conglomerate ledges along the shore of Copper Harbor; also frequent on the ground and on boulders in wet forest and on clay banks along the road between Phoenix and Copper Harbor, July, 1933 and September, 1935.

The geographical distribution of this species is very much like that of the last. The only other record from the Lake Superior region is from the Huron Mountains.

Lophozia Kunzeana (Hüben.) Evans. Locally common on moist trap-rock and conglomerate ledges at Copper Harbor and on high cliffs along Lake Superior; also on the ground and on boulders in deep forest along the lake, Fort Wilkins, Keweenaw County, September, 1935.

This species is another member of the arctic-alpine group, and shows the usual interesting distribution. Keweenaw Peninsula is only the second known locality in the Lake Superior district for this hepatic. The previous report, and the first one, was made by Nichols on the basis of material collected in the Huron Mountains.

Lophozia longidens (Lindb.) Macoun. On rotten logs in wet woods, Fort Wilkins, Keweenaw County, September, 1935.

This hepatic is known in Michigan only from several localities near Lake Superior, and on Isle Royale. It is one of a number of arctic-alpine species that are characteristic of the Lake Superior shore.

*Lophozia obtusa (Lindb.) Evans. On humus and boulders in dense, wet forest at Fort Wilkins, Keweenaw County, along the shore of Copper Harbor, September, 1935.

This species was first reported for North America from Juneau, Alaska, and was subsequently found to have a rather wide range in the western mountains (Wyoming, Idaho, Washington, Oregon, British Columbia), although nowhere common. It has also been reported from Ellesmereland, and from one New England station (Franklin County, Maine). This is the first report of the species in the Lake Superior region, although on the basis of the geographical distribution of many other species, its presence in Michigan is not at all astonishing.

Tritomaria exsectiformis (Breidl.) Schiffn. On rotten logs, humus, and moist rocks in forest, Houghton County, September, 1935; Keweenaw County, September, 1935.

This hepatic, although not at all a "critical" species, is noteworthy because of its abundance in Keweenaw and Houghton Counties. In the dense *Thuja* swamps near the ship canal, between Lake Linden

and Jacobsville, in Houghton County, the shaded roadside is often covered with mats of this species, in a pure growth, several feet across, and conspicuous because of the terminal clusters on each plant of the characteristic reddish gemmae.

Tritomaria quinquedentata (Huds.) Buch [*Lophozia quinquedentata* (Huds.) Cogn.] On moist trap-rock and conglomerate ledges along the lake shore, often growing just above the water level and then usually associated with *Scapania cuspiduligera* (Nees) K. Müll. and *Leiocolea Gillmani* (Aust.) Evans; on rotten wood, humus, and boulders in dense, wet woods, Fort Wilkins; also on moist talus blocks, near Cliff, Keweenaw County, September, 1935.

This is a characteristically northern species, and is known in Michigan only from Isle Royale and the south shore of Lake Superior.

Sphenolobus Hellerianus (Nees) Steph. Common on rather dry rotten logs in maple forest, Keweenaw County, September, 1935.

This is a distinctly northern species, and usually is abundant wherever it occurs.

Ptilidiaceae

Blepharostoma trichophyllum (L.) Dumort.

This is one of the most abundant hepatics on moist rock ledges along the shore of Lake Superior, where it often forms great mats. It is, in places, one of the most characteristic and conspicuous members of the plant association inhabiting the upper part of wet ledges. The conspicuousness of so small a species is noteworthy, as well as the habitat. Throughout the greater part of Michigan, this species is found only on humus or decaying wood, and becomes more and more rare to the south. It is apparently a typically northern species, saxicolous under optimum conditions, but able to exist on other substrata.

Scapaniaceae

Scapania cuspiduligera (Nees) K. Müll. This unique hepatic is locally very common on the low trap-rock and conglomerate ledges which form the shores of Agate, Copper and Horseshoe Harbors, and is most often accompanied by *Leiocolea Gillmani* (Aust.) Evans, Keweenaw County, September, 1935.

It is easily recognized in the field by the turgid appearance of the erect stems, upon which the lobes of the uppermost leaves are nearly equal in size. Each plant usually bears at the apex large masses of very dark gemmae, a characteristic which aids further to make identification of the species easy. The diagnostic characteristics by which

this plant may be recognized microscopically have recently been reviewed by Evans.[1] It is apparently not found very frequently in this country. The first locality recorded from North America was Pike's Peak, Colorado (1915). Other localities in the western Mountains (California, British Columbia, Alberta) were soon discovered. In 1929[2] this species was reported from Bayfield County on the Lake Superior shore of Wisconsin. Very recently[28] it has been reported from the shore of Lake Superior near the Montreal River, which forms the Wisconsin-Michigan boundary. The Keweenaw specimens make the disjunct distribution of *Scapania cuspiduligera* even more significant.

Frullaniaceae

Frullania Bolanderi Aust. This species is relatively common on the trunks of various kinds of trees (poplar, ash, birch, and arbor vitae) in the wet woods and swamps of Houghton and Keweenaw Counties.

It is easily recognized in the field, even without a lens, by the specialized erect branches without leaves. These structures project out beyond the prostrate, leafy stems, often in enormous numbers, so that well developed mats often have a curiously denuded appearance.

In view of the abundant production and dispersal of the caducous leaves, which act as a specialized means for vegetative reproduction, this species might be expected to be as common and widespread as the familiar *Marchantia polymorpha* L. Actually, however, its geographic distribution is perhaps as remarkable as that of any other American hepatic (Fig. 5). It was originally described from the vicinity of San Francisco, California, in 1869. Through the next fifty years, its known range was extended, as might be expected, up the west coast into Oregon, Washington, and British Columbia, so that now the species is known to be not uncommon there. In 1914[3] it was reported from Douglas County, Wisconsin, a remarkable range extension. The following year, it was recorded[4] from Bic, Rimouski County, Quebec. More recent range extensions have been to Emmet

[1] Evans, A. W. and G. E. Nichols, *The liverwort flora of the Upper Michigan Peninsula*, Bryologist, **38**: 81–91, 1935.

[2] Conklin, G. H., *loc. cit.*, 1929.

[3] Conklin, G. H., *Preliminary report on a collection of Hepaticae from the Duluth-Superior district, states of Minnesota and Wisconsin*, Trans. Wis. Acad. Sci., **17** (2): 985–1010, 1914.

[4] Evans, A. W., *Notes on North American Hepaticae, VI.*, Bryologist **18**: 81–91, 1915.

County, Iowa,[1, 2] which is the southernmost station in the central states, to Cook County, Minnesota,[3] and to Isle Royale.[4] It has been reported still more recently from the Porcupine Mountains and Keweenaw County, Michigan,[5] and also from Maine.[6]

In general, then, the geographical range of *Frullania Bolanderi* appears broken up into three remote and isolated "islands:" (1) throughout the Pacific coast area of the United States and Canada, (2) around the southwest end of Lake Superior, and (3) in the unglaciated part of the Gaspé Peninsula of Quebec, with an extension into Maine. The discovery of this hepatic in western Iowa is significant, although it is still impossible to determine whether it represents an extension southward of the Lake Superior "island" or an outlier of another isolated group. This anomalous geographical distribution gains still more significance because of its resemblance to that of many of the vascular plants reported from the Keweenaw Peninsula by Fernald.

*Frullania Oakesiana Aust. On the trunk of *Thuja* in a dense swamp near the ship canal, west of Jacobsville, Houghton County, September, 1935, mixed with *Frullania eboracensis* Gottsche.

Although this uncommon species was not recognized in the field, it was collected because of the slight but perceptible macroscopic differences from the ubiquitous and exceedingly abundant *F. eboracensis*. Under a lens, the autoecious inflorescence makes identification relatively easy.

At present, this hepatic is known only from New England, Nova Scotia, several localities in Quebec, and from the shores of Lake Superior in Minnesota, Wisconsin and now Michigan.

Frullania Asagrayana Mont. This common and widely distributed liverwort does not seem to be particularly frequent in Keweenaw County. When it occurs, it is more apt to be on somewhat exposed conglomerate cliffs than on trees, which form the usual habitat elsewhere in the state; July, 1933 and September, 1935.

[1] Conklin, G. H., *Report of the Curator of the Hepatic Department of the Sullivant Moss Society for 1928*, Bryologist, **32**: 21–23, 1929.

[2] Conard, H. S. and B. O. Wolden, *A key to the mosses of the Okoboji region*, Univ. Iowa Studies Nat. Hist. **14** (7): 1–27, 1932.

[3] Conklin, G. H., *A correction, with additions*, Bryologist **31**: 33, 1928.

[4] Thorpe, Frances J. and A. H. Povah, *loc. cit.*, 1935.

[5] Evans, A. W. and G. E. Nichols, *loc. cit.*, 1935.

[6] Parlin, J. C., *Notes on lichens and bryophytes from Maine*, Bryologist **38**: 73–80, 1935.

MUSCI

Andreaeaceae

Andreaea petrophila Ehrh. Locally abundant and in good fruiting condition, on talus blocks at foot of high cliffs near Phoenix and Cliff, Keweenaw County, September, 1935.

This species, although widespread in North America, usually at high altitudes, has been reported from only two localities in Michigan, Isle Royale and the Huron Mountains.

Fissidentaceae

Fissidens osmundioides Hedw. Not uncommon on wet rocks in small bays and "harbors" at the lake level, or in seepage pools, Keweenaw County, September, 1935.

Ditrichaceae

Saelania glaucescens (Hedw.) Broth. This moss, which is easily recognized because of the glaucous color of the plants, is not uncommon in crevices of rather dry conglomerate and trap-rock cliffs and ledges, Copper Harbor and vicinity, Keweenaw County, September, 1935.

Distichium capillaceum (Sw.) Bry. Eur. Rather uncommon in crevices of the lake shore rocks, Copper Harbor, Keweenaw County, September, 1935.

It is somewhat surprising that this common boreal species is not more abundant in the region.

Seligeriaceae

Seligeria Doniana (Sm.) C. Müll. Locally abundant in crevices of a rather dry conglomerate cliff west of Copper Harbor, Keweenaw County, September, 1935.

Blindia acuta (Huds.) Bry. Eur. Not at all uncommon along the shores of Copper Harbor on low trap-rock and conglomerate ledges, which are often wave-washed; usually sterile, September, 1935.

Dicranaceae

Dicranella Grevilleana (Brid.) Schimp. Infrequent in moist, shaded crevices on shore cliffs near Copper Harbor, Keweenaw County, September, 1935.

This species has been reported previously from Mackinac Island, and from the Munising region of Alger County, Michigan.

Paraleucobryum longifolium (Ehrh.) Loeske. Exceedingly frequent and abundant on rocks in moist, shaded places, especially on talus blocks where the slopes have been encroached upon by the forest, Keweenaw County, September, 1935.

Dichodontium pellucidum (Hedw.) Schimp. Common on trap-rock and conglomerate cliffs and ledges, where the rocks are kept moist by spray, or higher, along seepage channels, Keweenaw County, July, 1933 and September, 1935.

This moss is exceedingly variable, depending apparently upon the amounts of moisture and light which it receives.

*Dicranoweisia crispula (Hedw.) Lindb. Locally common along moisture-retaining seams and joints of exposed trap-rock cliff, shore of Copper Harbor, September, 1935.

This species, from its geographical distribution, is evidently typically arctic-alpine. It is widespread on the Pacific coast, and in the Rocky Mountain area, but is apparently known in the eastern states only from the summit of Mount Marcy, in the Adirondacks. The presence of the species in the Lake Superior region is therefore significant.

Oncophorus Wahlenbergii Brid. On rotten wood in dense forest, Fort Wilkins, Keweenaw County, September, 1935.

*Oncophorus virens (Sw.) Brid. Frequent, and often abundant, on wet trap-rock and conglomerate ledges, Copper Harbor and vicinity, Keweenaw County, September, 1935; also collected on the sandstone ledges on the west side of Au Train Point, in Alger County, in July, 1933.

The geographical range of *Oncophorus virens* is of much interest. In his revision of the genus Williams[1] makes the following statement of distribution: "Greenland to Alaska and south to Gaspé County, Quebec, Minnesota, and California." The range has been extended in the Rocky Mountain area since 1913, but so far as I can discover, no new eastern records have been published. The Minnesota specimen is from the Lake Superior highland region, so that, including the present material, the species has a significantly disjunct distribution.

Encalyptaceae

Encalypta ciliata (Hedw.) Hoffm. Rather frequent, but rarely abundant, in crevices of trap-rock and conglomerate cliffs, both along the shore of Lake Superior and inland, Keweenaw County, 1935.

This is apparently the most common species of *Encalypta* in the Upper Peninsula of Michigan.

Pottiaceae

Tortella fragilis (Drumm.) Limpr. Not uncommon on calcareous rocks, both along the shore of Lake Superior and on talus blocks; Keweenaw County, 1935.

[1] Williams, R. S., *Dicranaceae*, North Amer. Flora **15**: 77–158, 1913.

This is apparently the first report of the species from the Upper Peninsula.

Didymodon recurvirostris (Hedw.) Jennings (*D. rubellus* (Hoffm.) Bry. Eur.). On moist rock ledges along the shore of Copper Harbor, Keweenaw County, July, 1933 and September, 1935.

Tortula muralis Hedw. Common and abundant on dry, exposed trap-rock and conglomerate ledges, along the lake shore or inland. It often forms great mats many feet across on roadside ledges and on the bare summits of ridges, and is usually associated there with *Rhacomitrium canescens* (Timm) Brid.: Keweenaw County, July, 1933 and September, 1935.

Grimmiaceae

Rhacomitrium microcarpum (Schrad.) Brid. Infrequent on dry, exposed talus blocks, near Cliff, Keweenaw County, September, 1935.

Rhacomitrium canescens (Timm) Brid. Frequent and abundant on dry, exposed trap-rock and conglomerate ledges throughout Keweenaw County, especially conspicuous along roadsides, July, 1933 and September, 1935.

Bryaceae

Pohlia proligera Lindb. Not uncommon on moist rocks and soil along the shore of Copper Harbor, Keweenaw County, September, 1935.

The geographical distribution, as this species has very recently been redefined by Andrews[1] shows it to be a high-boreal species, with the characteristic range Rocky Mountains (Colorado, British Columbia); Lake Superior region (Minnesota, Wisconsin, Michigan); Quebec.

Mniaceae

Mnium Drummondii Bry. Eur. On the ground in *Thuja* swamp, Fort Wilkins, July, 1933.

The pale color of the leaves, which undergo very little alteration in shape or position during drying, and the small, pale, clustered sporophytes make this species one of the easiest to recognize. In spite of this fact, many of the specimens in herbaria identified as *M. Drummondii* are actually *M. cuspidatum* Hedw.

Meeseaceae

Meesea trichodes (Hedw.) Spruce. Not rare on moist rock ledges along the shores of Copper Harbor, usually associated with *Preissia quadrata* (Scop.) Nees and *Leiocolea Gillmani* (Aust.) Evans, Keweenaw County, September, 1935.

[1] Andrews, A. L., *Bryaceae*, Moss Flora of North America 2 (3): 184–210, 1935.

Bartramiaceae

Plagiopus Oederi (Gunn.) Limpr. Not infrequent in moisture-retaining crevices of conglomerate cliffs west of Copper Harbor, Keweenaw County, September, 1935; often in fruit.

Bartramia pomiformis Hedw. Not found on the lake shore, but very common inland on sheltered rocks, especially on talus slopes, Keweenaw County, September, 1935.

Timmiaceae

*Timmia austriaca Hedw. Locally abundant in a few places where the forest comes to the edge of the low trap-rock and conglomerate cliffs which form the shores of Copper Harbor, and where the soil and atmosphere are kept continually moist by the spray, Keweenaw County, September, 1935.

Although this moss occurs in only a few places along the shore, wherever it does appear it is exceedingly abundant, and very conspicuous because of the large size both of the individual plants and of the mats. Whereas sterile *Timmia megapolitana* Hedw. might be mistaken for and passed by as a *Catharinea*, *T. austriaca* Hedw. much resembles a large *Polytrichum*, and if sterile might be mistaken for some member of that genus. The plants bear abundant sporophytes, however, some of which, in September, are just past maturity and deoperculate, whereas the others are very young, and will without doubt produce and mature their capsules the following summer.

Timmia austriaca, in America, has hitherto been considered to be exclusively western or arctic. It was first discovered and reported from Colorado. In 1884 Lesquereux and James[1] gave as the distribution of the species simply "Rocky Mountains of Colorado." In the most recent revision of our American species of *Timmia*, Miss Sayre[2] gives for *T. austriaca* a much wider, but nevertheless consistently and distinctly northwestern range, as follows: "Greenland, Yukon Territory, Alberta, British Columbia, Vancouver Island; in the United States, Rocky Mountains south to New Mexico, east to Nebraska." This, then, is a distinctly northern and western species, which illustrates very well the isolation of western plants in the Keweenaw Peninsula (Fig. 1).

Orthotrichaceae

Orthotrichum anomalum Hedw. On cliffs of soft Cambrian sandstone, near Bête Gris, Keweenaw County, September, 1935.

[1] Lesquereux, L. and T. P. James, *Manual of the Mosses of North America*, 447 pp., 6 pl., Boston, 1884.

[2] Sayre, Geneva, *Timmiaceae*, Moss Flora of North America 2 (3): 145–149, 1935.

*Orthotrichum strangulatum Schwaegr. Locally abundant on the vertical sides of an enormous boulder in the forest at base of talus slope, near Cliff, Keweenaw County, September, 1935.

Although this is a relatively common and widespread moss, it does not seem to have been reported from Michigan previously.

Orthotrichum speciosum Nees. Common on trunks of ash and poplar in moist forest, Keweenaw County, September, 1935.

Orthotrichum obtusifolium (Schrad.) Brid. On the trunks of deciduous trees in dense woods, infrequent, but usually in fruit, Fort Wilkins, Keweenaw County, September, 1935.

Neckeraceae

Neckera pennata Hedw. Very common on trees in moist forests, also frequent on rocks. Some of the depauperate forms on exposed rocks, especially along the shore of Lake Superior, very puzzling. Throughout Keweenaw County, July, 1933 and September, 1935.

Homalia Jamesii Schimp. Very frequent and abundant on trap-rock blocks in the forest at base of talus slopes; Keweenaw County, September, 1935.

Theliaceae

Myurella julacea (Vill.) Bry. Eur. Not uncommon in moist crevices of trap-rock and conglomerate cliffs, in the vicinity of Copper Harbor, Keweenaw County, September, 1935.

Myurella gracilis (Weinm.) Lindb. On trap-rock ledges along the Silver River, between Eagle Harbor and Copper Harbor, Keweenaw County, September, 1935.

Leskeaceae

*Pseudoleskea oligoclada Kindb. Very common and abundant on rather dry boulders in hardwood forests and on shaded talus slopes, usually in good fruiting condition, Keweenaw County, July, 1933 and September, 1935.

Although the fine fruiting material collected in 1933 was discovered to be a *Pseudoleskea*, final determination was not completed until the 1935 collections had been made. This species was also collected in the Porcupine Mountains by Dr. Nichols and the writer, in August, 1935.

This moss has perhaps the most significant geographical distribution of any of the mosses yet known from the Keweenaw Peninsula (Fig. 3). It was originally described from material collected on Vancouver Island. Since the original description of the species, its range has been extended considerably. In the most recent revision of the genus, Sharp[1] says: "On rocks in the mountains, British Columbia

[1] Sharp, A. J., *Pseudoleskea*, Moss Flora of North America, 3 (4): 185–190, 1934.

to Colorado and Utah." This species probably agrees better than any of the others with the present distribution of many of the vascular plants reported by Fernald from Keweenaw County.

AMBLYSTEGIACEAE

HYGROAMBLYSTEGIUM FLUVIATILE (Sw.) Loeske. Not uncommon in small rock pools and water-filled joints and seams along the rocky shores of Lake Superior, near Copper Harbor, Keweenaw County, September, 1935.

HYGROAMBLYSTEGIUM ORTHOCLADON (Wils.) Loeske. Frequent on wave-washed rocks, near the water line, or in beach pools, near Copper Harbor, September, 1935.

HYGROAMBLYSTEGIUM IRRIGUUM (Wils.) Loeske var. SPINIFOLIUM (Sch.) Grout. In beach pools, Copper Harbor and Horseshoe Harbor, Keweenaw County, September, 1935.

*HYGROAMBLYSTEGIUM IRRIGUUM (Wils.) Loeske forma MARIANOPOLITANUM Dupret. In seepage channels through trap-rock ledges along the shore of Copper Harbor, Keweenaw County, September, 1935.

HYGROHYPNUM MOLLE (Dicks.) Loeske. At water level, in crevices of conglomerate ledge along shore of Lake Superior, west of Copper Harbor, September, 1935. Also collected earlier in the summer in the Porcupine Mountains.

Lesquereux and James interpreted *Hypnum molle* Dicks. very broadly and considered it as a common eastern species. As a result of later and more intensive study, as well as a trend toward narrower species concepts, the old species was split into two, which are the present *Hygrohypnum molle* and *H. dilatatum* (Wils.) Loeske. It is rather surprising to discover that the current *H. molle* has a completely western range. For its distribution, Grout[1] gives: "On stones in streams; arctic-alpine and infrequent. Northwestern U. S. and western Canada from the Rocky Mountains northward and westward." In fact, the wide distribution of this species in the Pacific northwest is so well recognized that it is used as the final distinguishing mark of the species in Grout's key.

The interrelation of *Hygrohypnum molle* and *H. dilatatum* is difficult to interpret. Grout (l. c.) treats *H. dilatatum*, which is common and widely distributed not only through the west, but also through eastern North America, as a subspecies of *H. molle*. Dixon[2] points out the difficulty in deciding which form should be considered

[1] Grout, A. J., *Amblystegieae*, Moss Flora of North America, 3 (2): 63–114, 1931.

[2] Dixon, H. N., *The student's handbook of British mosses*, Ed. III., xlviii + 582 pp. 43 pl., Eastbourne, 1924.

as the subspecies. Although *H. molle* was described much earlier, *H. dilatatum* is much more widely distributed and more common, in the British Isles, as well as in North America. *Hygrohypnum dilatatum* is reported from Michigan only from Isle Royale.

*Hygrohypnum eugyrium (Bry. Eur.) Loeske. Not uncommon on wave-washed trap-rock ledges. Copper Harbor and vicinity, Keweenaw County, September, 1935.

This is a widely distributed species in northern North America.

Hygrohypnum ochraceum (Turn.) Loeske. On wet trap-rock ledges in sheltered pool, Horseshoe Harbor, Keweenaw County, September, 1935. Not common.

Hygrohypnum palustre (Huds.) Loeske. This is the commonest *Hygrohypnum*, occurring on wave-washed ledges and in seams and joints of the rock which are filled with seepage water; Keweenaw County, July, 1933 and September, 1935.

Hypnaceae

Hypnum fertile Sendtn. On humus and rotting wood, in moist forest, Fort Wilkins, Keweenaw County, September, 1935.

Breidleria arcuata (Lindb.) Loeske. On low, moist, trap-rock and conglomerate ledges along the shores of Copper Harbor, often very near the water level, Keweenaw County, September, 1935.

In southern Michigan, the habitat of this moss is on soil and rotten wood in swamps and wet woods.

Isopterygium Muellerianum (Schimp.) Lindb. Rather frequent on the shaded, vertical sides of very large trap-rock blocks in forest at foot of talus slope, near Cliff, Keweenaw County, September, 1935; also Porcupine Mountains, August, 1935.

Hylocomiaceae

*Rhytidium rugosum (Ehrh.) Kindb. Not uncommon on talus fragments at the very base of the slope, where shaded by trees, often in very large mats, near Cliff, Keweenaw County, September, 1935.

The geographic distribution of this species, although boreal, is of very little real significance. The only remarkable fact is that it has not been found before in Michigan.

Hylocomium pyrenaicum (Spruce) Lindb. Frequent and often abundant on boulders and rotten logs in dense forest; also on shaded talus blocks, Keweenaw County, September, 1935.

Polytrichaceae

Polytrichum alpinum Hedw. var. silvaticum (Menz.) Lindb.

Found in abundance only at the foot of talus slopes near Cliff, and on a rocky shore near Bête Gris, Keweenaw County, September, 1935.

Department of Botany,
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Ann Arbor, Michigan.

IRREGULARITIES IN THE FLORAL PARTS OF TRADESCANTIA OZARKANA

Cora Shoop

On April 19, 1929 one plant of *Tradescantia ozarkana* Anderson & Woodson with white flowers was taken from the colony near Roaring River, the typical locality of the species, and planted in a window box at Monett, Missouri. The following spring the box was placed on the ground in partial shade at Steelville. An irregularity in the number of petals was noted each of the two following years, but no record was kept. In September, 1933 the plants were transplanted to the ground where they could receive only morning sunshine. Doubling continued. In the fall of 1933 the plant was moved to a position where it received only western sunshine. The original plant by the spring of 1935, when the following record was begun, numbered fifteen many-branched stalks.

Irregularities occurred on any stalk, both young and old, on axillary as well as on terminal umbels. The individual parts of irregular flowers were normal in size and appearance. No observations in the field have been made of irregularities in the species; casual observation in 1929 and in 1935 did not reveal any digressions in floral parts.

No irregularities occurred in *Tradescantia virginiana* L. which was collected at Sarcoxie, Missouri the same spring and cultivated with the plants of *T. ozarkana;* also *Tradescantia subaspera* Ker-Gawl. transplanted to the same garden continued to display the normal number of floral parts.

Mature capsules developed on irregular flowers as readily as on normal, but in no capsule were more than six seeds matured.

The plants continued in full bloom with about the same ratio of normal to abnormal flowers until the stalks were destroyed by water June, 1935.

Flowering records for the spring of 1935 are summarized in Table I.

TABLE I. Flowering record of TRADESCANTIA OZARKANA for spring 1935.

Number of flowers examined	904
" " irregular flowers	109
" " flowers with petals of same number as sepals	65
" " " " fewer petals than sepals	14
" " " " more " " "	40
" " " " stamens twice as many as petals	75
" " " " " one less than twice number of petals	25
" " " " " more than twice the number of petals	3
" " " " two petals and two sepals	3
" " " " " sepals and three or more petals	14
" " " " three or more sepals	68
" " " " ratio of 4–4–8 (Table II)	48

TABLE II. Daily record of abnormal as compared with normal flowers; (x ?) represents the number of flowers in which the ratio at the left occurs.

Date	Number of normal flowers	Number of abnormal flowers	Number of petals	Number of sepals	Number of stamens
May					
1	6	3	4	2	8
			4	4	8
			4	4	7
2	8	2	4	4	8
			6	6	12
3	12	3	4	4	8 (x 2)
			4	3	7
4	17	8	4	4	8 (x 8)
5	12	3	4	4	8
			5	5	10
			6	4	12
24	40	1	4	4	8
25	27	5	4	4	8 (x 4)
			4	3	7
26	24	3	4	4	8
			4	3	8
			4	2	7
27	18	1	4	4	8
28	21	3	4	4	8
			4	3	7
			3	2	6
			4	4	8
			4	4	7
29	19	6	4	4	9
			4	3	6
			4	2	7
			3	2	6
30	23	1	4	2	7
31	29	3	4	4	8
			4	3	8
			2	2	6
June					
1	34	9	4	4	8 (x 2)
			4	4	7 (x 2)
			4	3	7
			4	2	7

TABLE II.—*Continued*

Date	Number of normal flowers	Number of abnormal flowers	Number of petals	Number of sepals	Number of stamens
June					
			4	2	5
			2	2	4
			5	5	10
			4	4	8 (x 3)
			4	3	8 (x 2)
			4	3	7
2	27	8	3	2	6
			5	5	11
			4	4	8 (x 5)
			4	3	7
			4	3	8
3	20	10	4	2	7
			2	2	4
			5	5	10
			4	4	8 (x 6)
			4	3	8 (x 2)
4	35	14	4	3	7 (x 2)
			4	2	7
			4	4	6
			5	5	10
			4	4	8 (x 3)
5	48	5	4	3	8
			4	3	7
			4	4	8 (x 3)
6	33	5	4	4	7
			4	3	7
7	31	2	4	4	8
			4	3	8
8	39	2	4	4	8
			4	3	8
9	31	3	4	3	6
			4	3	7
			4	3	8
10	40	3	4	4	6
			4	3	7 (x 2)
11	28	0			
12	28	1	4	4	8
13	36	0			
14	30	2	4	3	3
			4	3	7
15	44	2	4	4	8
			4	4	7
16	37	1	4	4	8

Observations of the same plant (*Tradescantia ozarkana* reported for 1935) were made again in May and June of 1936. This year the behavior was even more erratic. The first two flowers, opened May 1,

were irregular as were the three which opened the following day. On the third day there were six flowers with a ratio of 1 normal to 1.5 abnormal. The number of normal then increased over abnormal until May 11 when the ratio was 11 normal to 1 abnormal. From May 12 the number of normal flowers decreased until May 18 when the ratio was 1.3 normal to 1 abnormal. Following this period of steady and very marked decrease, there occurred a period of ten days with only slight variations between 1.3 and 1.9 normal to 1 abnormal. After May 29, the normals began a steady and rapid gain and continued up to a ratio of 13 to 1 by June 9.

The greatest number of flowers produced on any one day was 66 on May 27, with 37 normal and 29 abnormal. The petals ranged in number from 2 to 8 inclusive, the sepals from 2 to 6, and the stamens from 5 to 14. Combinations of 4 petals, 4 sepals, and 8 stamens occurred 50 times. The 4-3-8-combination occurred 28 times, and the 4-4-7 occurred 18 times. Some less frequent, but higher combinations were: 5-5-10; 6-6-12; 6-5-13; 7-5-14; 8-3-12; and 8-4-11.

From May 1 to June 9, the plant produced 965 flowers with a ratio of 2.23 normal to 1 abnormal for May; and of 10.6 to 1 for June.

The plant was not cultivated. Seedlings from the 4-4-8-combinations were established this spring, but will not flower until next spring, if then.

Steelville, Missouri.

THE CORRECT NAME OF THE LEAFY SPURGE[1]

C. V. Morton

The weed known as leafy spurge, of some importance in recent years, has in the United States always been known as *Euphorbia Esula* L.[2] However, in the 1928 Report of the Division of Botany, Department of Agriculture, Dominion of Canada, p. 15, occurs the following statement:

During 1928 the known distribution in the western provinces of a spurge, *Euphorbia virgata* (which has passed in the east as *E. Esula*), has been extended by a number of specimens received.

In October, 1931, Dr. M. O. Malte wrote to Dr. Herbert Groh as follows:

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] J. B Norton, Ann. Rep. Mo. Bot. Gard. **11**: 85. 1900. Gray's Manual, ed. 7, 549. 1908. Britt. & Brown, Ill. Flora ed. 2, **2**: 473. 1913. Rydberg, Flora of the Plains, 519. 1932. Muenscher, Rhodora **32**: 100. 1930, and Cornell Extension Bull. 192. 1930.

An article on *Euphorbia Esula* and its allies by the late Professor Ostenfeld, published in Botaniska Notiser, 1903, gives the characters of *E. Esula* and *E. virgata* as follows:

"*E. Esula*: leaves lanceolate or obovate-lanceolate, broadest above the middle or rarely of equal width throughout, rounded and generally broadened at the apex, thin and without lustre. The lateral inflorescences (those in the axils of the leaves below the main umbel) few or rarely several."

"*E. virgata*: leaves lanceolate or linear-lanceolate, broadest below the middle, acute or acutish, firm and generally somewhat lustrous. The lateral inflorescences numerous."

I may say that all our specimens are *virgata*. We should be glad to have specimens of *Esula*, should you come across it.

In 1932 my attention was directed to these facts by Prof. Herbert C. Hanson, who quoted to me the above letter, and I was able to confirm the opinion of Dr. Malte. It seems, therefore, worth while to call attention to this correction of a prevalent erroneous identification of this common weed. The characters given above by Dr. Malte do not, however, always distinguish between the two species. A more fundamental distinction is found in the lobing of the glands of the cyathium, as follows:

Horns of the glands of the cyathium shorter than the width of the gland (or sometimes nearly obsolete), not denticulate nor enlarged at the apex. Leaves broadest above the middle, narrowed at base, usually subserrulate near apex.....**E. Esula** L

Horns as long as or longer than the width of the gland, enlarged at the apex, at least the larger ones denticulate on the margins. Leaves broadest below the middle, not narrowed at base, acute at apex.....**E. virgata** Wald. & Kit.

Leaves broadest above the middle, narrowed at base, obtusish at apex.....**E. virgata** forma **esulifolia** Thell.

The plants of the midwest are all true *E. virgata*, but most of those of the Atlantic seaboard are referable to forma *esulifolia*. I have seen no specimens of undoubted *E. Esula* from the United States.

United States National Museum,
Washington, D. C.

On Ectocarpus granulosus.—*Ectocarpus granulosus* Ag. was first collected by Mr. Borrer. Since that time it has been found, but never in abundance, widely dispersed in the Mediterranean and from the British Isles to the Cape of Good Hope. What has been regarded as an identical species is abundant on the California coast. But in recent years, this has been separated by Setchell and Gardner as *E. granulosoides*.

When Dr. Farlow published his *Marine Algae of New England*, in 1881, he noted its occurrence sparingly from Newport, Rhode Island to Portsmouth, New Hampshire. After that assiduous collector, Dr. Frank S. Collins, had spent years in the study of the marine algae of the Casco Bay, Maine he failed to find this species. But he noted that there was a specimen in the herbarium of the Portland Society of Natural History without exact locality.[1]

In the summer of 1931 I gathered three specimens, on *Laminaria*, in Bluehill Bay, Maine. These have been deposited in the National Herbarium. Since that time, a careful search has failed to locate further material.

It would seem that this form is not well adapted to our cold waters. Though the typical species is profusely ramose, these specimens bore only three to five branches and presented the appearance of a severely pruned shrub. While elsewhere this form is two to four inches high, our specimens were only about twelve mm. high. But abundant sporangia were present, as were two unmistakable characters which mark this aberrant species. In other *Ectocarpi* the chromatophores are band-shaped and more or less spiral; here, they looked like discs punched from a bronze plate. Furthermore, the filaments were enclosed in so dense a felt of corticating cells that one might pardon Kuetzing's attempt to place this species in a separate genus, *Corticularia*.—R. E. Schuh, Brooklin, Maine.

Ranunculus **neglectus** (Greene), comb. nov. *Cyrtorhyncha neglecta* Greene, Pittonia, iv. 146 (1900). Type locality: "Ravines about Golden City," Jefferson Co., Colorado.

This species is a very local endemic in Jefferson Co. It is evident from Greene's statement, l. c., 147, that Mr. E. Bethel collected the material upon which Greene based his description at least in part. Specimens from the "Exact type locality, dry hillside, Mt. Morrison, Jefferson Co., alt. 2120 m." collected June 3, 1921 by *E. Bethel & I. W. Clokey* 4118 will be distributed in Plantae Exsiccatae Grayanae. Although the two statements of the type locality differ, in actuality they mean the same place.

Rydberg, Flora Colorado, 146 (1906), in his key to *Cyrtorhyncha* points out the characters distinguishing this species from its nearest relative, *Ranunculus ranunculinus* (Nutt.) Rydb. (*R. Nuttallii* Gray).

[1] Proc. Portl. Soc. Nat. Hist. vol. II. p. 269.

Oxygraphis Bunge, Verz. Suppl. Fl. Alt., 46 (1836) seems doubtfully distinct from *Ranunculus*. *Oxygraphis* is prior to *Cyrtorhyncha* Nutt. ex Torrey and Gray, Flora North America i. 26 (1838). Benson, Am. Journ. Bot. xxiii. 27 (1936) considers *Cyrtorhyncha* a subgenus of *Ranunculus*.—Louis C. Wheeler, Gray Herbarium.

Spring Flowers in Autumn.—The exceptional and almost unprecedented hot and arid summer in Oklahoma followed by abnormal rains and cool weather during the fall has brought several plants which normally flower only in the spring, into full bloom in October. On a recent field trip (October 10th) I was very much surprised to find *Nothoscordum bivalve* (L.) Britton, *Oxalis violacea* L., *Sagittaria latifolia* Willd., *Viola Rafinesquii* Greene, and *Claytonia virginica* L. in full flowering condition. In addition, numerous cultivated flowering shrubs are in bud at the present time, giving a decidedly vernal aspect to the autumnal vegetation.

From June 5th until the middle of September no rain fell in the vicinity of Norman (except for a 5-minute shower in mid-July) but during the last two weeks of September it rained almost constantly every day for 14 days, and during the first part of October, although the days were cool and clear, there were numerous showers. The summer was unusually hot with the temperature often reaching 100° and higher, and botanizing during July and August yielded very poor results. Legumes, grasses, euphorbias, composites and numerous other large groups of plants which are characteristic of the midsummer prairie flora were either totally dead or in such poor condition that specimens were not worth collecting. But the late appearance of the fall rains with cool weather brought out interesting spring plants and made the autumnal collecting interesting, varied and profuse.—Milton Hopkins, The University of Oklahoma.

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